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From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>  
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Today's Topics:

SPACE TRIVIA LIST UPDATE - 5th August, 1993

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>  
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

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Date: Wed, 4 Aug 1993 23:03:51 GMT  
From: munnari.oz.au!metro!seagoon.newcastle.edu.au!scorch!lukpla@uunet.uu.net  
Subject: SPACE TRIVIA LIST UPDATE - 5th August, 1993  
To: ham-space@ucsd.edu

IF YOU POSSIBLY CAN, PLEASE CONTRIBUTE TO THIS LIST. THIS LIST DEPENDS  
UPON THE KIND DONATIONS OF ITEMS FROM PEOPLE ON THE NET.

I must warn you that some items are not quite in their final  
form. This list has been posted as it is for the moment to make way  
for other projects using this system for the next few days, so I  
wanted to clear the update file area.

It's pretty much hit it's peak now I think. The incoming  
trivia has slowed down the last day or two, and I myself am getting  
down to business with other commitments. The last few weeks have been  
really quite intense, as you can see with the frequency of updates  
I've been posting. In the last 2 weeks the list has grown quite  
rapidly, and the change of post format (from full to update) has  
demanded some extra time from myself in the creating of two files. At  
this moment I am not absolutely sure that the TRIVIA LIST is perfectly  
in agreement with the update.

I've also gone through a couple of about-faces with my posting to rec.radio.amateur.space. I have received quite a number of submissions from people who come from that group who found it interesting. Whilst I'm still not sure of the majority consensus of that group, it seems at the moment the benefits of posting there are marginally better than the drawbacks. All followups to that group, though, are forced into sci.space, so readers of the trivia list be warned that this is where your followups will be fed if you are moved to do this.

I haven't heard anything from sci.astro, so I am assuming that it is being well received in that group. Aside from a recent correction, in fact, I can't recall anyone specifically mentioning that they are posting from sci.astro.....hope all is well.

The latest full list has also just been posted to the two ftp sites.

This list is now available via anonymous ftp from the following sites:

krakatoa.jsc.nasa.gov as /misc-docs/trivia.txt  
ames.arc.nasa.gov as /pub/SPACE/MISC/trivia.txt

If at ANY time you want the latest update on the trivia list, then it will be at one of these sites. I will be updating the complete list to these sites each time an update appears in the newsgroups.

The news distribution of this file is now:-

sci.space  
sci.space.shuttle  
sci.astro  
rec.radio.amateur.space

Luke Plaizier - Space Trivia List Moderator

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*      SPACE TRIVIA - Interesting Trivia Information on Manned and      *
*                               Unmanned Spaceflight from anywhere around the *
*                               Globe. (Or the Universe for that matter!)    *
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(11) This is actually several combined into one, as they are from the

same source. They are fact, but the exact source is unknown at the moment. Further SSME details have become available, and are located as items 149 - 162. Anyone with information as to the source of confirmation or denial of the following items, please direct email to the moderator.

- (a) 2 SSME's could generate as much power as that used by a NIMITZ class aircraft carrier.
- (b) The Fuel and hydrogen pumps of 3 SSME's combined could generate as much power as that used by the battleship IOWA plus 12 ETHAN class submarines.
- (c) The combustion in 3 SSMEs combined, to make one shuttle flight system, releases more energy than the combined nuclear power plants of 9 non-US countries. (but which ones?)
- (d) The turbo-pumps on the SSME rotate at 37,000 rpm. Formula One engines can rotate at up to 15,000 rpm. A standard 1990's vintage motor vehicle is very lucky to rev to 10,000rpm.  
[PLEASE SEE ITEMS 149-152 FOR FURTHER SSME ITEMS]

- (19) The Liquid Hydrogen Turbo-Pumps on a Space Shuttle Main Engine weigh as much as a standard V8 Motor Vehicle engine, but output some 310 times the power. (See also item 150) [SHUTTEL, Nigel MacKnight.]

- (128) There was a much cheaper way of launching satellites, according to McGill University experimenters in 1963. Developing an idea proposed by Jules Verne, the McGill team used a rebored 50-foot-long cannon from the battleship USS Washington to loft missiles to an altitude of 65 miles.

By employing this technique to launch a Martlet rocket, the McGill experimenters reckoned they could put a 50-pound payload into orbit for less than the dollar equivalent of 18,000 pounds.  
[Item from GUESSWORK that could have True or False. Below is answer.]

True, except that it turns out to be really hard to design a useful payload that will survive the G-loads. I'm not sure if he was at McGill, but the person who was involved in the project (HARP) was a guy called Bull who was later involved in the Iraqi supergun and ballistic missile projects and was recently killed. "Project HARP" never put projectiles into ORBIT, just sent them to high ALTITUDES.  
[Answered by jcm@urania.harvard.edu (Jonathan McDowell)]

- (128a) Jules Verne was not the first guy to propose shooting cannonballs into space! There's a famous illustration in Newton's \*Principia Mathematica\* showing a cannon launching satellites...  
[Bill Higgins-- Beam Jockey <HIGGINS@FNALV.FNAL.GOV>]

- (130) The Manned orbiting Laboratory, simply a cylindrical lab attached to a Gemini spacecraft, was to provide for 30-day missions to orbit like the early soviet Salyut space stations. The MOL got so far as having a mock-up launched atop a Titan IIIC rocket on November 3, 1966.  
[The Illustrated Encyclopedia of Space Technology. Kenneth Gatland.]

- (133) Models of the Vostok space capsule, which took the world's first man into space, Yuri Gagarin, in 1961, were tested previously as Sputniks 4, 5, 6, 9 and 10 and were successful 3 of these times. [Manned Spaceflight Log, Tim Furniss.]  
Sputnik was a Western name for the early Soviet unpiloted space satellites, known at that time in the USSR generically as Iskusstvenniy Sputnik Zemli (Artificial Earth Satellite). The spacecraft known in the West as Sputniks 4, 5, 6, 9 and 10 were announced at the time in the USSR as Korabl'-Sputnik 1, 2, 3, 4 and 5. Their internal names were Vostok type 1K nos. 3, 5, 6 and (the last two) Vostok type 3KA nos. 1 and 2. [Source: Vladimir Agapov, Moscow]. There were two other Korabl'-Sputnik launches which failed to reach orbit, so the success rate was 3 out of 7.  
[jcm@urania.harvard.edu (Jonathan McDowell)]
- (137) Gordon Cooper was the first man to enter orbit twice, with a flight on Mercury-Atlas 9 (The first Mercury-Atlas flight was no 6, with John Glenn), and Gemini 5.  
[Manned Spaceflight Log, Tim Furniss.]
- (137a) Grissom flew on MR-4/Liberty Bell Seven in 1961 (suborbital) and on Gemini 3 in 1965. Joe Walker made suborbital spaceflights on the X-15 in 1961 and 1963, becoming the first in space twice in Jul 1963 and three times in Aug 1963. Joe Engle made his second suborbital X-15 spaceflight a couple of weeks before Gemini V. [The X-15 flights qualify if space is considered to start at 80 km, although even if you adopt the FAA boundary of 100 km Walker's two 1963 flights qualify and make him beat Grissom].  
[jcm@urania.harvard.edu (Jonathan McDowell)]
- (148) The Gemini spacecraft needed an object to aim for in practising rendezvous techniques necessary for the Apollo missions. They used special Agena Docking Adaptor launched by an Atlas. The original Adaptor (Not used with Gemini 9) was essentially a modified Agena stage. The adaptor to be used on Gemini 9 unfortunately failed to release it's nose shroud correctly, resulting in the renowned 'Angry Alligator' pictures of the two half sections of the nose cuse apart but unwilling to move any further.  
[The Illustrated Encyclopedia of Space Technology. Kenneth Gatland.]
- (148a) The GATV (Gemini Agena Target Vehicle) was an Agena D with a TDA (Target Docking Adapter) on the front. But the GATV for Gemini 9 fell in the ocean on launch. It was replaced by a backup called the ATDA (Augmented Target Docking Adapter) which was NOT a modified Agena - it was just the TDA with a cylindrical back end to mate it straight to the Atlas.  
[jcm@urania.harvard.edu (Jonathan McDowell)]

- (149) Fifty times a second, the SSME electronic controller evaluates itself and the engine and then adjusts the engine valves to obtain peak performance during the Shuttle Orbiter's launch and ascent.
- (150) Although not much larger than an automobile engine, the SSME high-pressure fuel turbopump generates 100 horsepower for each pound of its weight, while an automobile generates about one-half horsepower for each pound of its weight.
- (151) Each of the 122 high-pressure fuel pump turbine blades, about the size of a half-dollar, generates 700 horsepower while spinning at 37,000 rpm.
- (152) Rocketdyne's Space Shuttle Main Engines operate at greater temperature extremes than any mechanical system in common use today. The fuel, liquid hydrogen, is -423 degrees Fahrenheit, the second coldest liquid on Earth, and when burned with liquid Oxygen, the temperature in the engine's combustion chamber reaches +6000 degrees Fahrenheit - higher than the boiling point of iron.
- (153) The SSME high-pressure fuel turbopump main-shaft rotates at 37,000rpm compared to about 3,000rpm for an automobile engine operating at 60mph. (roughly 110km/h)
- (154) The maximum equivalent horsepower developed by the three SSME's, is just over 37 million horsepower.
- (155) If water, instead of fuel, were pumped by the three Rocketdyne Space Shuttle Main Engines, an average family-sized swimming pool could be drained in 25 seconds.
- (156) One Rocketdyne Space Shuttle Main Engine generates enough thrust to maintain the flight of 2.5 Boeing 747 airliners.
- (157) Discharge pressure of an SSME high-pressure fuel turbo-pump could send a column of liquid Hydrogen 180,000 feet into the air.
- (158) The energy released by three of Rocketdyne's Space Shuttle Main Engines is equivalent to the output of 23 Hoover Dams.
- (159) During launch and ascent, the three SSME's empty the half-million gallon external tank in about 8.5 minutes.
- (160) Even though Rocketdyne's Space Shuttle Main Engine weighs one-seventh as much as a locomotive engine, it's high pressure fuel pump alone delivers as much horsepower as 28 locomotives, while its high-pressure oxidizer delivers the equivalent horsepower for 11 more.

- (161) The ACTS - Advanced Communication Technology Satellite, launched on STS-51, will provide the largest transponder throughput ever - 1.0 gigibits per second (GBPS)  
[STS-51 Payload Handbook]
- (162) The space-suits worn by the original 7 Mercury astronauts were individually tailored to each astronaut. In Schirra's words they required "More alterations than a bridal gown."  
[Life in Space, ISBN 0-8094-4900-5]
- (163) The 27-year-old test pilot, Yuri Gagarin, of the Soviet Air Force, was jumped from senior lieutenant to Major just before his memorable Vostok flight.  
[Life in Space, ISBN 0-8094-4900-5]
- (164) Even though Gemini was by far a larger and more sophisticated version of Mercury, A simplified sequencing system - and especially the elimination of the scape tower - reduced the number of relays from 220 in Mercury to 60 in Gemini.  
[Life in Space, ISBN 0-8094-4900-5]
- (165) Oddly, while everything but metal was badly burned during the tragic Apollo 1 fire, a portion of the flight plan survived with only a few pages singed.  
[Life in Space, ISBN 0-8094-4900-5. Page 139, you can see the paper.]
- (166) Each of the F-1 engines, used in the first stage of the Saturn V Apollo moon launcher, was about as big as a two-and-a-half-ton truck, and used three tons of propellants a second.  
[Life in Space, ISBN 0-8094-4900-5]
- (167) The Saturn V absorbed the know-how and energies of 325,000 people in 12,000 firms. As tall as a 36-story building, it had 11 engines. The five engines that powered the first stage alone were designed to develop 160 million horsepower, the capacity of 86 Hoover Dams.  
[Life in Space, ISBN 0-8094-4900-5]
- (168) The journalists recording the historic launch of Apollo 11 had to wait some 15 seconds for the noise of the Saturn V ignition to reach them. By that time, the rocket had already risen silently into the air.  
[Life in Space, ISBN 0-8094-4900-5]
- (169) When Soyuz 19 was launched in July of 1975, for the Apollo Soyuz Test Project, the Soyuz was launched from the same pad that had launched Sputnik some 18 years before.  
[Life in Space, ISBN 0-8094-4900-5]



- (5) Von Braun was one of the most far-sighted men in human history. The rocket he designed for the V-2 worked perfectly, he told a friend when the first V-2's hit London, except that they landed on the wrong planet!  
[Life in Space, ISBN 0-8094-4900-5]
- (6) Gemini 3's lift-off was reportedly so smooth that neither of the astronauts felt anything - the starting of the mission clock on the instrument panel alerted them.  
[Life in Space, ISBN 0-8094-4900-5]
- (7) One of the CapCom's during the recovery of (I think) Apollo 15 said (roughly): "we can bring these things down in Clear Lake if we want".  
[aws@iti.org (Allen W. Sherzer)]

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*      PURE GUESSWORK - Items that are awaiting verification for
*                      placement into either rumour or fact trivia.
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- (1) It seems that after STS-1 got in orbit, one of the astronauts was eager to try out the (older, also expensive) toilet. I think it was Crippen. Apparently all John Young heard was this "Whoosh AHHHHHH!!!!". There is a fan in it to suck down the contents. Apparently the fan was verified to be working correctly (i.e. it spun up) but nobody ever checked to see if it sucked or blew...  
[From HOLLIS@TITAN.KSC.NASA.GOV]
- (2) When trying to find a way to keep the water out of the parachute compartment after splashdown, scientists ended up using a product from a drug store. I saw this on a space travel special. The story goes something like one of the project scientists sons was up with a cold. So, the scientist mixed up a cold remedy gel (added water to a powder) for his son late one night. This gave him the idea. When itemizing the inventory for the project budget, they used the drug store product code and used a backwards spelling of the product name. Of course, they adapted it a bit for the spacecraft, but the same principle of this gel was used.  
[mark.blevis@gmail.dgrc.doc.ca]
- (3) Supposedly, one shuttle launch was delayed due to a rare bird nesting in the launch pad gantry. Does anyone know if this is true and if so



which launch ? (According to the guide on a KSC coach tour - probably not the most reliable of sources 8-})  
[Mark Grant <mark@isltd.insignia.com>]

- (4) The Demise of Blue Streak and ELDO put paid to plans laid in 1968 to launch leeches - 'the world's most ideal space travellers' - on an extended flight.

"Give them a bloody meal before they go, and they'll need nothing for a year-and-a-half!" was how one scientist characterized the suitability of leeches for space travel. Posing no feeding or waste disposal problems, leeches might even breed en-route - providing researchers with a useful insight into the genetic side-effects induced by exposure to radiation in space.

- (5) In some respects, Neil Armstrong was fortunate to become the first Moonwalker. In 1963, his place in the history books was under seige from a chimpanzee named Howard!

After just one year of study at the US Space School, Howard had broken the world's land speed record in a rocket propelled sled, and had been banned from playing noughts-and-crosses with visitors because he usually won!

The chances are that if a monkey had been selected to fly to the Moon instead of a man, it would have been Howard.

- (6) Under the direction of NASA's Ames Research Center in California, a study was conducted into the viability of employing a 'vacuum cleaner' type device in Low-Earth orbit to collect some of the particles of Moonrock (tectites) that are dislodged from the lunar surface by annual meteorite showers and sometimes find their way to the Earth's surface.

Collected in orbit and returned to Earth by parachute, samples gathered in this way would be free from the contamination caused by passage through the Earth's atmosphere.

- (7) In reference ot item 64 in the trivia list, Is the reason given true? 1978-1986 the rumor was that if ejected at 100 Kft then you would drift up to 200 Kft before falling back. During the fall, the aero heating would become so intense that helmet melting would be likely. I'd love to know real reason the 100Kft limit was enacted.  
[from rlove@raptor.rmug.org]

- (8) One of my favorite stories (though you should probably check out the veracity of it) is in regards to the Apollo program. Several of the early launches were on Little Joe II rockets, which were solid fuel boosters, and were designed mainly to test the escape tower system. The Little Joe II rocket was described by one NASA official as being "the most reliable booster we've ever built". On the last such flight, the fuel charge in the Little Joe II shattered several seconds before

the scheduled test of the escape tower, creating a true emergency for the escape tower to handle (the escape tower worked perfectly). The Little Joe II launches, by the way, took place at White Sands Missile range.

[jones%azterra@sj.ate.slb.com (Clark Jones)]

- (9) Is there any truth to the rumor that Dick Nixon ordered all plans for the Saturn V destroyed so that they wouldn't fall into the hands of the Soviets?

[jones%azterra@sj.ate.slb.com (Clark Jones)]

- (10) At one time, the Gemini space craft was going to land on land rather than on water, with a rather bizzare inflatable "hang-glider" instead of parachutes. (I remember having a NASA publication when I was a kid that had drawings of this configuration. It even showed the storage compartment for the inflatable wing running between the two hatches.)

[jones%azterra@sj.ate.slb.com (Clark Jones)]

(Can anyone come up with some sources for backing up/refuting the last three items?)

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End of Ham-Space Digest V93 #2

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